

The vowels in 'pig' vs. 'tofu': A contact-induced merger in Toronto Heritage Cantonese?



Holman Tse
hbt3@pitt.edu
University of Pittsburgh

Department of Linguistics

NWAV 47

New York University

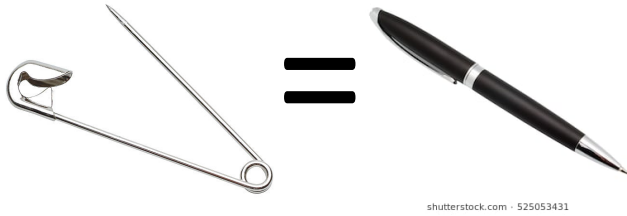
October 21, 2018



HERITAGE LANGUAGE VARIATION AND CHANGE IN TORONTO

[HTTP://PROJECTS.CHASS.UTORONTO.CA/NGN/HLVC](http://projects.chass.utoronto.ca/ngn/hlvc)

Nothing new in variationist research ...



LOT = THOUGHT

- BUT:
 - What about vowel mergers that are contact-induced?
 - This study involves influence from a linguistically dominant L2 (acquired as a child) on a heritage language (acquired as an L1).



=



?

Cantonese words:

[t̪sy̌1] ZYU1

[tew̌1.fǔ1] (DAU6) FU6

/y/ = /u/ merger?

On contact-induced mergers

- “It would be helpful to know more about the limitations on children’s ability to learn new dialects and on adults’ inability to learn them. Our knowledge of the diffusion of mergers is particularly inadequate, both for adults and children” (Labov 2007: 383)
- One of few examples of diffusion of merger discussed in Labov (2007, 2011) is Herold’s (1990, 1997) study of low-back merger in Northeastern Pennsylvania

Diffusion of merger example

LOT-THOUGHT merger developed in historic anthracite mining communities, but not in towns lacking a history of mining (Herold 1990, 1997)

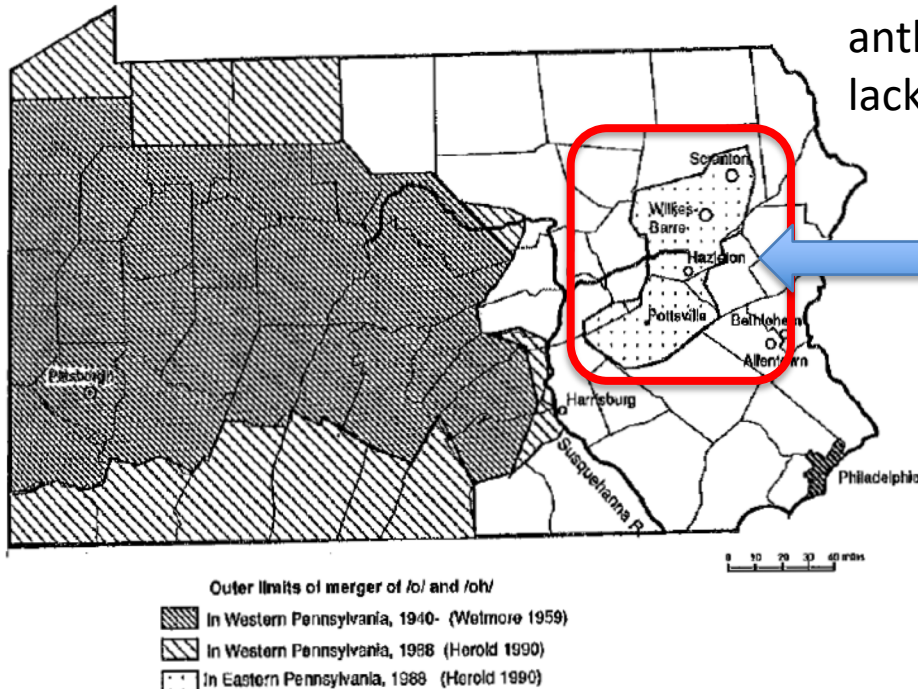


Figure 11.3. Outer limits of /o/ ~ /oh/ merger in Pennsylvania in 1940 and 1988 (Adapted from Herold, 1990)

Map from Labov (1994)

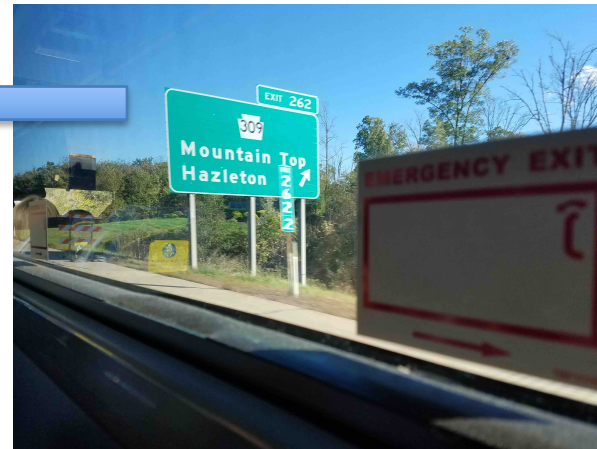


Photo taken by
Holman Tse
10/18/2018

These communities attracted many immigrants (particularly from Eastern Europe) in the late 19th and early 20th centuries

Lack of similar contrast in these immigrant languages →
LOT-THOUGHT merger in the English spoken by subsequent generations via
contact-induced change

Toronto Heritage Cantonese

Homeland Cantonese



<http://imp.ucla.edu/profile.aspx?menu=004&langid=73>

Toronto Heritage Cantonese



<http://www.whereig.com/images/cities/toronto-location-map.jpg>

- **1960s:** First large wave of immigration from Hong Kong (UK Colony ~90% Cantonese speakers) to Canada
- **1980s-1997:** More immigration, motivated by fears of handover to China
- **2011 Census:** 178,000+ (3.1%+ of population) Cantonese speakers in Toronto
 - Now the 2nd most spoken mother tongue (after English)

Contact Setting

GEN 1 Speakers

- Born and raised in HK, came to Toronto as adults, AND have lived in TO for > 20 years
- Variable levels of English knowledge



Photo by Holman Tse, 2014

ENGLISH (L2
learned as child)



Possible L2 to
L1 influence?

廣東話 (L1, not a societally
dominant language in Toronto)

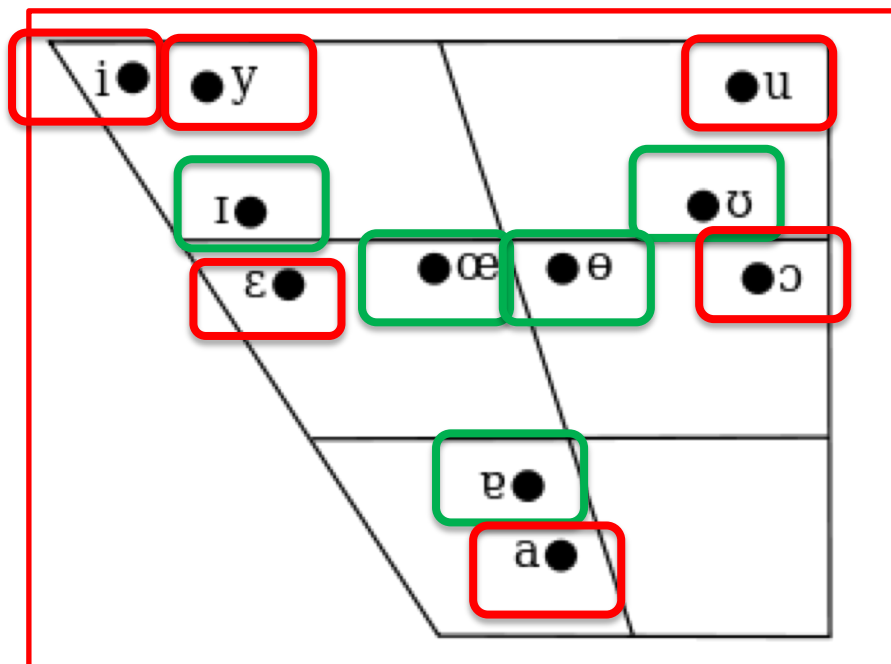
GEN 2 Speakers

- Grew up in TO
- Learned Cantonese primarily at home (L1)
- All linguistically dominant in English (L2) as evidenced from Ethnic Orientation survey questions

A different type of contact setting

- Influence going the other direction
 - From societally dominant language to an immigrant language rather than the other direction as in Herold (1990, 1997)
 - Following Thomason & Kaufman's (1988) terminology: *Language Maintenance* (Toronto Heritage Cantonese) vs. *Shift-induced Interference* (Mining communities in NE PA, ethnolects in general)
 - Can different directions of influence lead to the same linguistic outcome?

Cantonese Monophthongs



Description
following Zee (1999)

TENSE (Open/Closed Syllables)

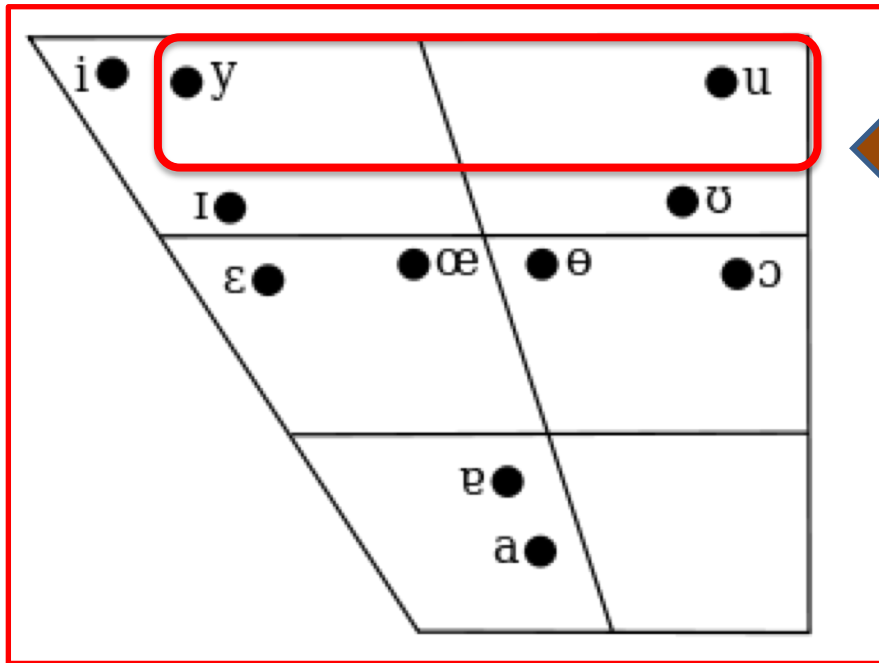
Vowel	Example	Vowel	Example
i	si, 'silk'	a	sa, 'sand'
y	sy, 'book'	ɔ	sɔ, 'comb'
ɛ	sɛ, 'to lend'	u	fu, 'husband'
œ	hœ, 'boot'		

LAX (Closed Syllables Only)

Vowel	Example
ɪ	sɪk, 'color'
ʊ	sʊk, 'uncle'
ɵ	sɵt, 'shirt'
ɐ	sɐp, 'wet'

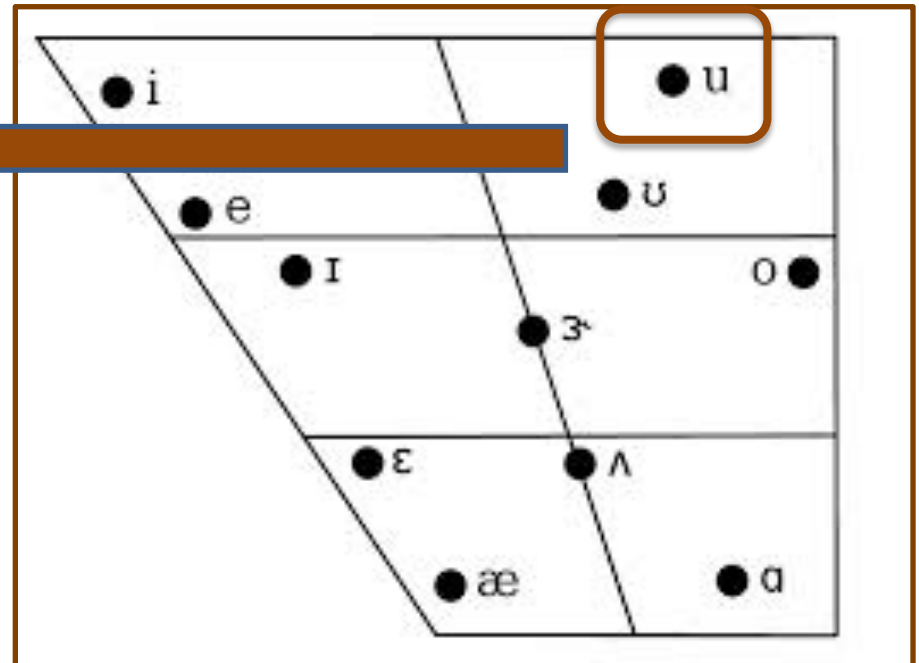
Merger between /y/ and /u/?

Cantonese Vowel System



Cantonese has two high round tense vowels

Toronto English Vowel System



English has only one round tense vowel
(phonetically fronted)

Does English influence on Cantonese mean change towards loss of /y/ vs. /u/ contrast?

Distribution of /y/ vs. /u/

Possible Onsets	/y/	/u/
Labial		[pun ¹] 'to move'
Labio-dental		[fu ¹], 'bean curd or tofu'
Labio-velar		[wun ¹], 'bowl'
Alveolar	[t ^h sy ¹], 'pig'	
Palatal	[jy ¹] 'fish'	
Velar	[kyn ¹], 'roll'	[kun ¹], 'public building'
Glottal	[hyn ¹], 'circle'	

Minimal pairs possible only following velar onset
No clusters in Cantonese

The Data

- HLVC (Heritage Language Variation and Change) Project Corpus (Nagy et al 2009, Nagy 2011)
 - Digital recordings (.wav) of:
 - hour-long sociolinguistic interviews (spontaneous speech sample)
 - Ethnic Orientation Questionnaire responses
 - picture naming task responses
 - Fortuitously included words with /y/ and /u/
 - Recordings transcribed by native (including heritage) Cantonese speakers using the Jyutping Romanization system

The 32 Speakers Analyzed

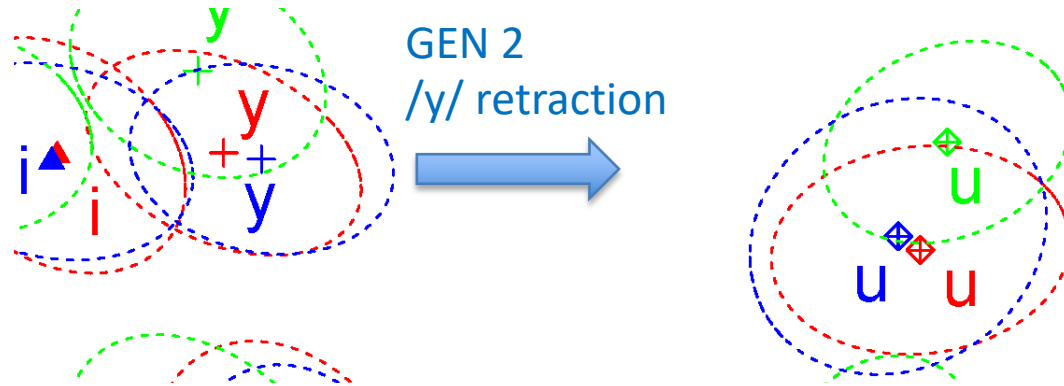
Group	GEN 1	GEN 2	Homeland*
Age Range	46-87	20-44	16-77
Time in Hong Kong	Born and raised in Hong Kong	N/A	Born and raised in Hong Kong
Time in Toronto	Moved to Toronto as adults, lived in Toronto > 20 years	Lifelong Toronto residents or have lived in Toronto since age of 4	N/A
English Proficiency	Variable, but Cantonese dominant	English dominant	Variable, but Cantonese dominant
TOTAL	N = 12	N = 12	N = 8

* Homeland speakers included to strengthen/weaken arguments for contact-induced change

Data Processing

- Prosodylab aligner (Gorman et al 2011) and Praat script used to obtain midpoint F1 and F2 of all usable tokens of the 11 monophthongs recorded
 - Words with onset glides /j, w/ excluded
 - Manual review of output to ensure accurate formant measurements
- Lobanov Normalization method used (Thomas & Kendall 2007)

Results: Intergenerational Comparison



Model of the F2 of /y/
Fixed effect: "generation"
Random Effects: speaker and word

	Coefficient	Tokens	F2 Mean (Hz)
GEN 1	23	563	1634
GEN 2	-23	321	1608

r^2 [fixed] = 0.050, r^2 [random] = 0.331
 r^2 [total] = 0.381

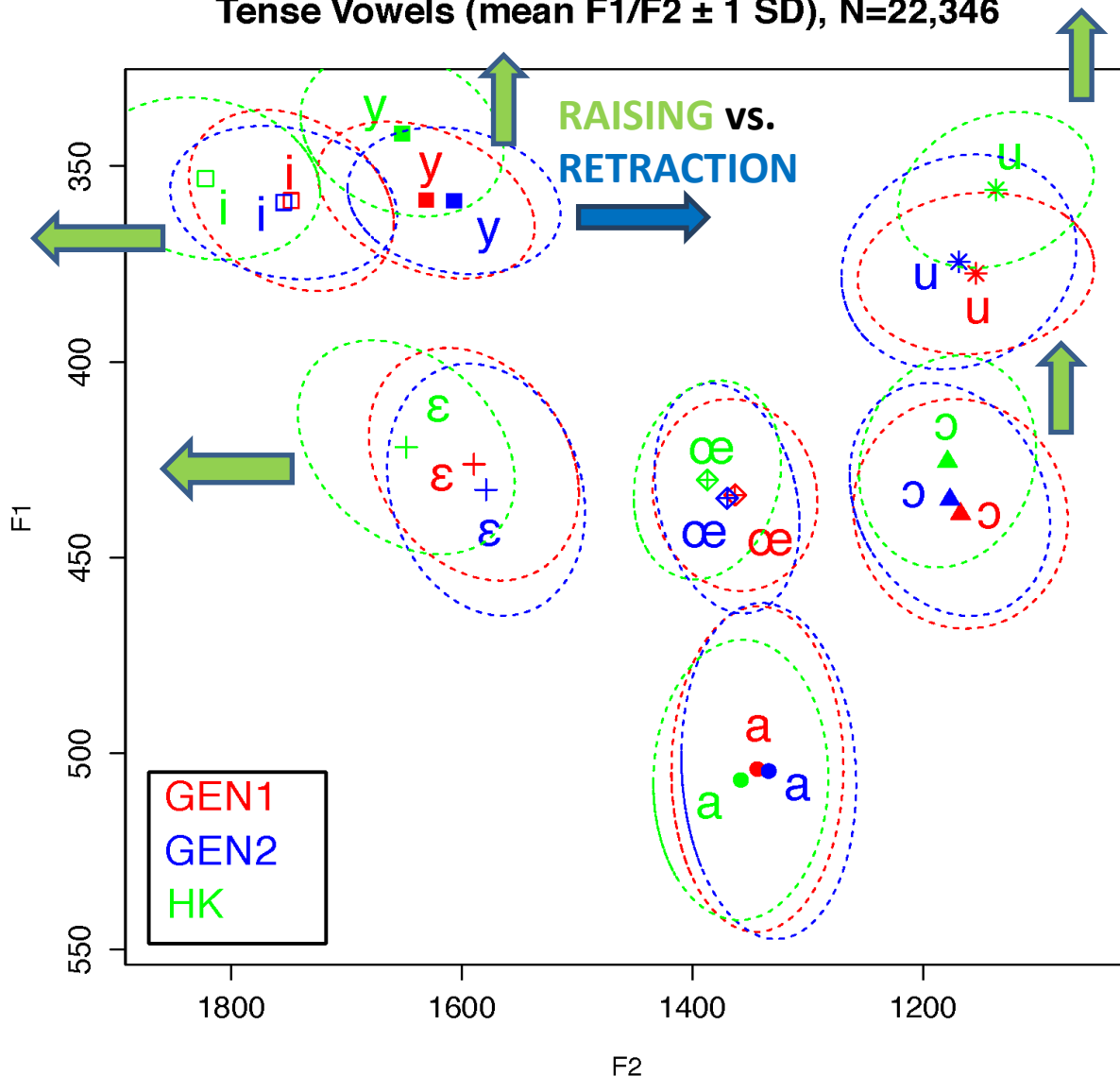
Model of the F2 of /u/
Fixed effect: "generation"
Random Effects: speaker and word

Generation n.s. for the F2 of /u/
 N = 600

Fronted /y/ Sample	Retracted /y/ sample
C2M44A 	C2M21B 

Results: Diatopic Comparison

Tense Vowels (mean F1/F2 \pm 1 SD), N=22,346



- ZYU1 retraction not found in Homeland
- Raising found instead and general peripheralization of the vowel space (consistent with Lee 1983)

Results: CAN % Score

- CAN % Score: Number of transcribed Cantonese words \div total number of transcribed words
- Speakers with higher CAN % Scores used more Cantonese in the interview (and generally less code-switching)

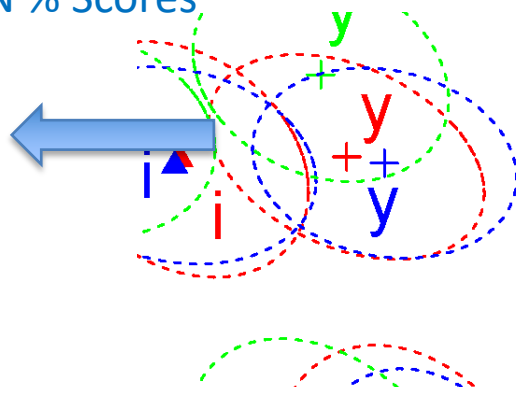
Best Step-down Model for F2 of /y/
Random: Speaker and Word
Fixed: % CAN Score

		Coefficient	Tokens
continuous	+1	187	351
r^2 [total] = 0.412, r^2 [random] = 0.3174, r^2 [fixed] = 0.0946 r^2 [total] = 0.381			

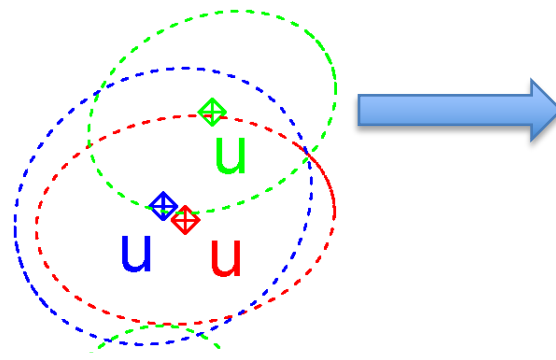
Best Step-down Model for F2 of /u/
Random: Speaker and Word
Fixed: % CAN Score

		Coefficient	Tokens
continuous	+1	-204	165
r^2 [total] = 0.412, r^2 [random] = 0.3174, r^2 [fixed] = 0.0946 r^2 [total] = 0.381			

Higher CAN % Scores



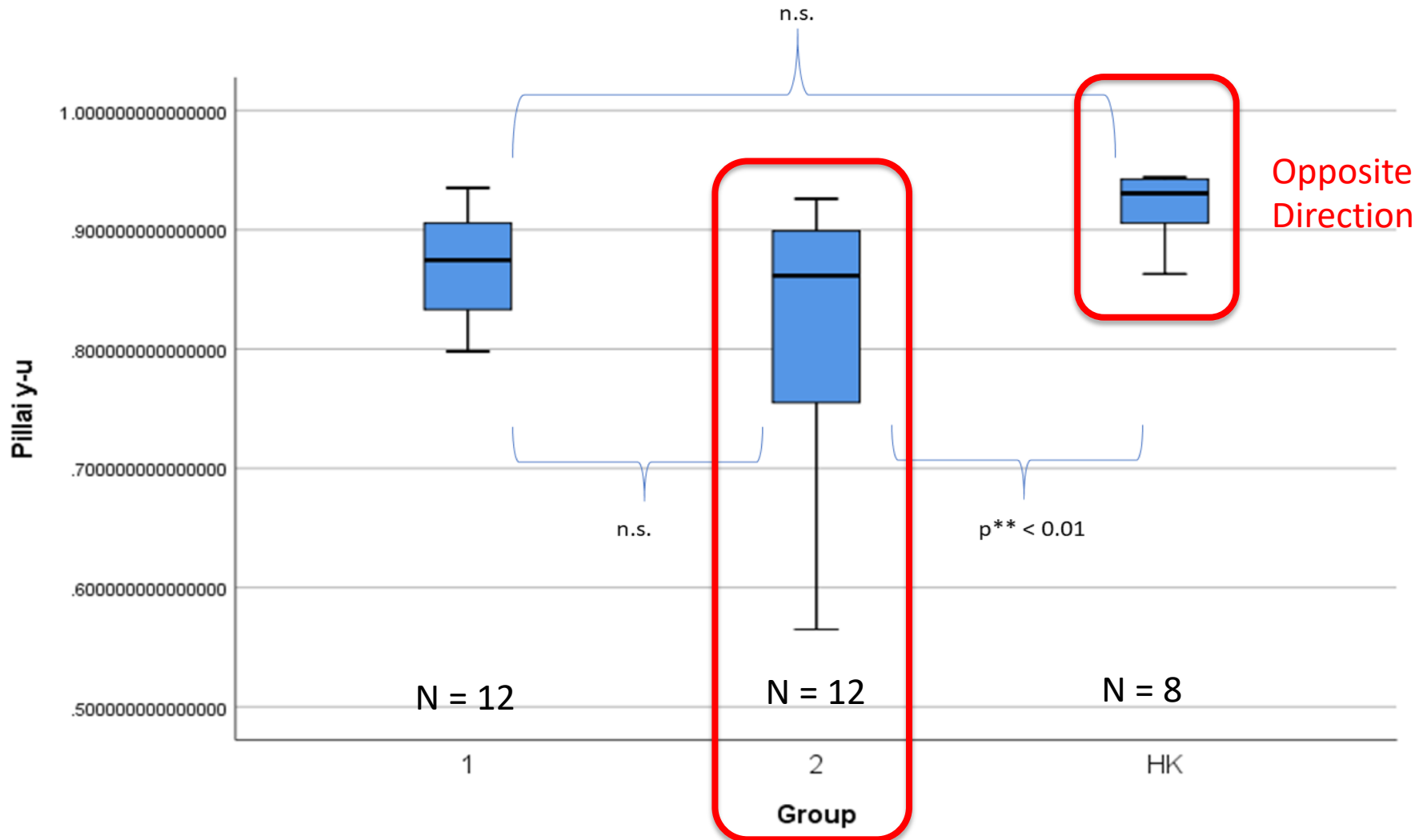
Higher CAN % Scores



Pillai Scores for measuring merger

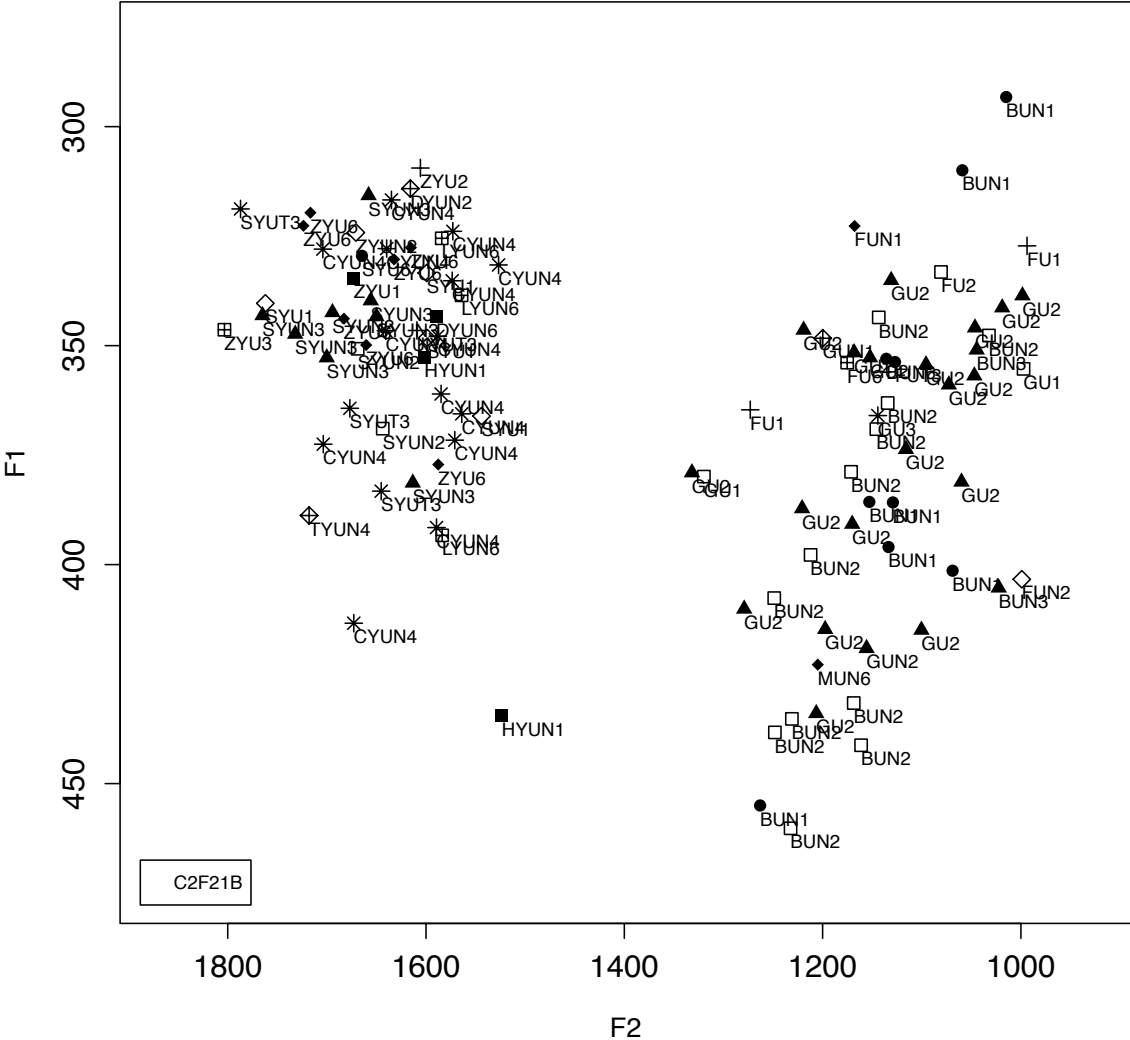
- A “summary [statistic] of the degree to which two distributions are kept distinct” (Hay et al 2006)
- An increasingly popular method used in sociolinguistic studies of mergers in progress (Nycz & Hall-Lew 2013)
- Continuous scale from 0 (suggests most merged) to 1.0 (suggests least merged)
 - Separate scores calculated for each individual speaker
 - No real standard for distinguishing btwn merged and not merged
 - BUT for reference: 0.300 or below for merger set in Hall-Lew (2009)

Range of Pillai Scores for /y/ vs. /u/ differences



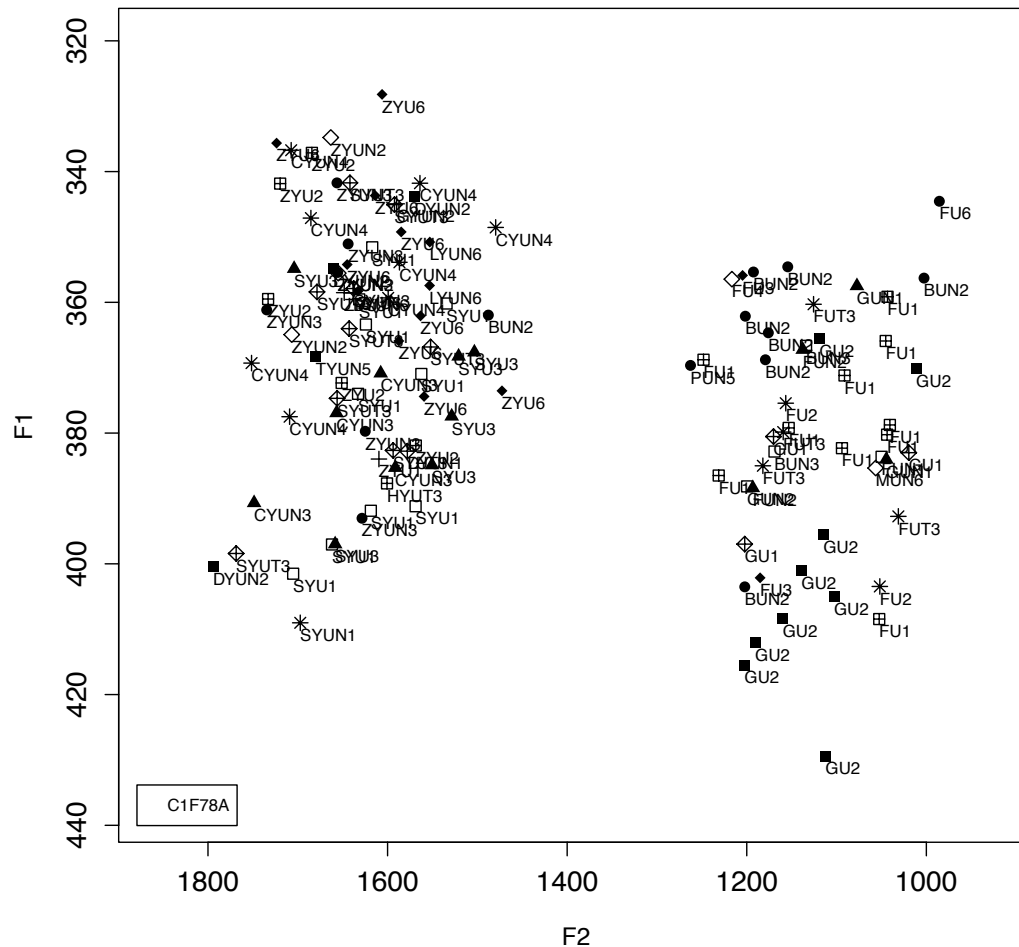
GEN 2 speaker with highest Pillai Score

/y/ vs /u/ (Lobanov normalized)

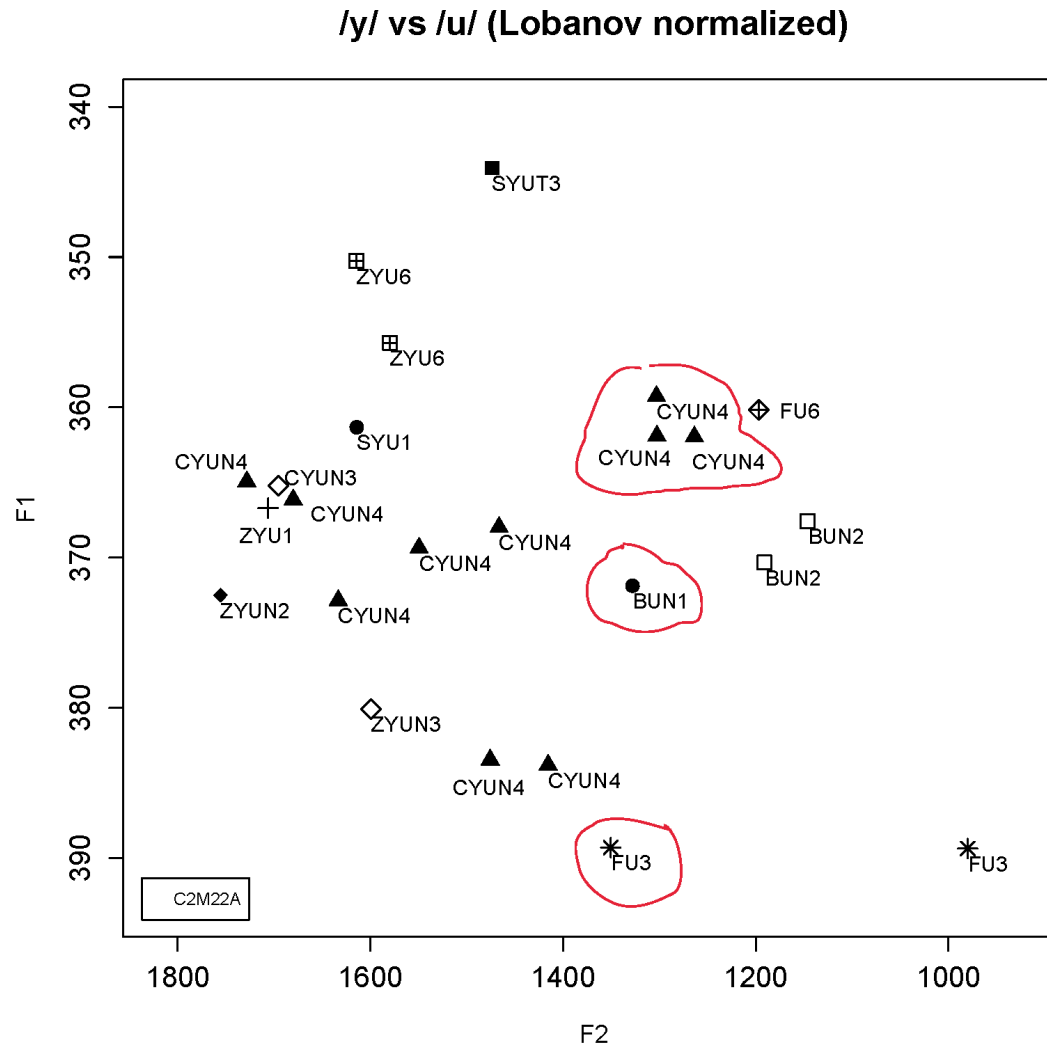


GEN 1 speaker sample

/y/ vs /u/ (Lobanov normalized)



GEN 2 speaker with lowest Pillai Score



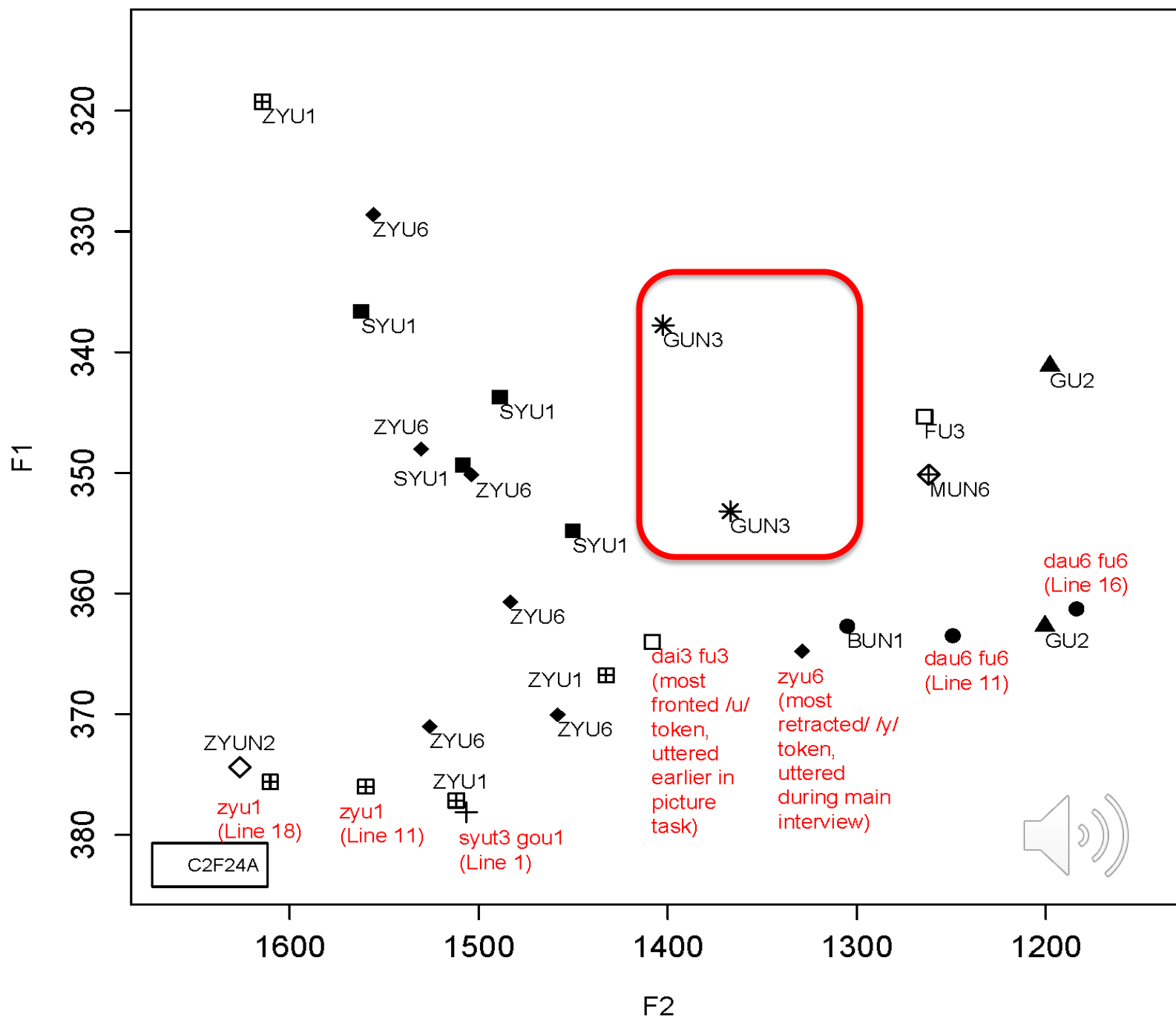
Metalinguistic awareness of /y/ vs /u/?

‘ice cream’

‘fish’

1. C2F24A: uh, <syut3 gou1 ... jyu2 ... beng2> ... what’s so funny?
2. Interviewer: [(LAUGH)]
3. C2F24A: [Did I say it wrong?]
4. Interviewer: Your pronunciation
5. C2F24A: [What?] ‘fish’
6. Interviewer: [I can’t] say <jyu2> (IMITATING C2F24A)
7. C2F24A: Oh I said it right?
8. Interviewer: No, wait say it again.
9. C2F24A: <jyu2> ‘fish’
10. Interviewer: OK. ‘tofu’ ‘pig’
11. C2F24A: “No, people say I say things weird [like] <dau6 fu6> or like <zyu1>
12. Interviewer: [yeah, it’s]
13. C2F24A: they all [say] I say it wrong!”
14. Interviewer: [yeah]
15. Interviewer: <zyu1> and <jyu2, dau6 fu6> is right
16. C2F24A: I said <dau6 fu6> right? ‘tofu’
17. Interviewer: Yeah, <zyu1> and <jyu2>, I think you said it wrong.
18. C2F24A: <zyu1> ‘pig’
19. Interviewer: [yeah! (LAUGH)]
20. C2F24A: [yeah! (LAUGH)]





Summary of Results

- F2 of ZYU1 significantly retracted for GEN 2
- Lack of the same change in Homeland Cantonese
- Lower CAN % Scores favor ZYU1 retraction and FU6 fronting
- Pillai scores show wide range
 - Some speakers maintain a strong distinction, others are more merged
- At least one speaker seems more merged in more spontaneous speech
- Some speakers notice these differences

Next Steps

- Comparative analysis with the English vowels from the same speakers
- Does Toronto English /u/ merge with Cantonese /y/ for speakers leading in /y/ vs. /u/ merger?
- Comparative data also available from Hoffman & Walker (2010) corpus showing Cantonese GEN 2 speakers with fronted GOOSE in English
- Further in the future: minimal pair data

Conclusion

- Few documented examples in variationist literature of contact-induced vowel mergers with exception of Herold (1990, 1997)
- Evidence presented of a case of contact-induced vowel merger
 - Contact going in the other direction
 - L2 (more dominant and learned as a child) to L1 rather than L1 to L2 influence
- But similar to Herold (1990, 1997) in showing how influence from a language (or languages) with one phoneme in one part of the vowel space can lead to merger in a language with two phonemes in the same part of the vowel space
- Amount of Cantonese spoken in interview appears to be important
 - Is this about linguistic dominance?
 - Is this about proficiency?
 - Is it about other factors?
 - A combination of these factors?

HLVC Cantonese RAs: Collaborators:

Abigail Chan

Karen Chan

Tiffany Chung

Rachel Coulter

Radu Craioveanu

Joyce Fok

Rita Pang

Andrew Peters

Mario So Gao

Josephine Tong

Sarah Truong

Ka-man Wong

Olivia Yu

Minyi Zhu

Yoonjung Kang

Alexei Kochetov

James Walker

Funding for HLVC

Project:

SSHRC, University of
Toronto

Additional

acknowledgements:

Naomi Nagy

Scott Kiesling

Shelome Gooden

Alan Juffs

University of

Pittsburgh Dietrich

School of Arts &

Sciences and

Linguistics

Department

Jevon Heath

Melinda Fricke

Jeffrey Lamontagne

Claude Mauk

Dominic Yu



UNIVERSITY OF
TORONTO



Social Sciences and Humanities
Research Council of Canada

Conseil de recherches en
sciences humaines du Canada

References

Slides will be available at: <http://www.pitt.edu/~hbt3/presentations.html>

Contact me at: hbt3@pitt.edu

- GORMAN, KYLE.; JONATHAN HOWELL.; and MICHAEL WAGNER. 2011. Prosodylab-aligner: A tool for forced alignment of laboratory speech. *Canadian Acoustics* 39.192–193.
- HALL-LEW, LAUREN. 2009. Ethnicity and Sound Change in San Francisco English. *Annual Meeting of the Berkeley Linguistics Society*, 35:111–122. <http://journals.linguisticsociety.org/proceedings/index.php/BLS/article/download/3603/3308>.
- HAY, JENNIFER.; PAUL WARREN.; and KATIE DRAGER. 2006. Factors influencing speech perception in the context of a merger-in-progress. *Journal of Phonetics* 34.458–484.
- HEROLD, RUTH. 1990. Mechanisms of merger: The implementation and distribution of the low back merger in eastern Pennsylvania. United States -- Pennsylvania: University of Pennsylvania ph.d. dissertation. <http://search.proquest.com.pitt.idm.oclc.org/pqdtglobal/docview/303882706/abstract/89C88B3BD4B44D62PQ/1>.
- HEROLD, RUTH. 1997. Solving the actuation problem: Merger and immigration in eastern Pennsylvania. *Language variation and change* 9.165–189.
- HOFFMAN, MICHOEL F.; and JAMES A. WALKER. 2010. Ethnolects and the city: Ethnic orientation and linguistic variation in Toronto English. *Language Variation and Change* 22.37–67. doi:10.1017/S0954394509990238.
- LABOV, WILLIAM. 1994. *Principles of linguistic change, Volume 1*. Oxford, UK; Cambridge, MA: Blackwell.
- LABOV, WILLIAM. 2007. Transmission and Diffusion. *Language* 83.344–387.
- LABOV, WILLIAM. 2011. *Principles of linguistic change, cognitive and cultural factors*. Vol. 3. John Wiley & Sons.
- LEE, THOMAS. 1983. The vowel system in two varieties of Cantonese. *UCLA Working Papers in Phonetics* 57.97–114.
- NAGY, NAOMI. 2011. A Multilingual Corpus to Explore Variation in Language Contact Situations. *Rassegna Italiana di Linguistica Applicata* 43.65–84.
- NAGY, NAOMI.; YOONJUNG KANG.; ALEXEI KOCHETOV.; and JAMES WALKER. 2009. Heritage Languages in Toronto: A New Project. Paper presented at the Heritage Language Workshop, University of Toronto.
- NYCZ, JENNIFER.; and LAUREN HALL-LEW. 2013. Best practices in measuring vowel merger. *Proceedings of Meetings on Acoustics* 166ASA, 20:060008. ASA.
- THOMAS, ERIK.; and TYLER KENDALL. 2007. *NORM: The vowel normalization and plotting suite*. <http://lingtools.uoregon.edu/norm/norm1.php>.
- THOMASON, SARAH GREY.; and TERRENCE KAUFMAN. 1988. *Language contact, creolization, and genetic linguistics*. University of California Press.
- ZEE, ERIC. 1999. Chinese (Hong Kong Cantonese). *Handbook of the International Phonetic Association: a guide to the use of the International Phonetic Alphabet*, 58–60. Cambridge: Cambridge University Press.